

Rhodora

JOURNAL OF THE
NEW ENGLAND BOTANICAL CLUB.

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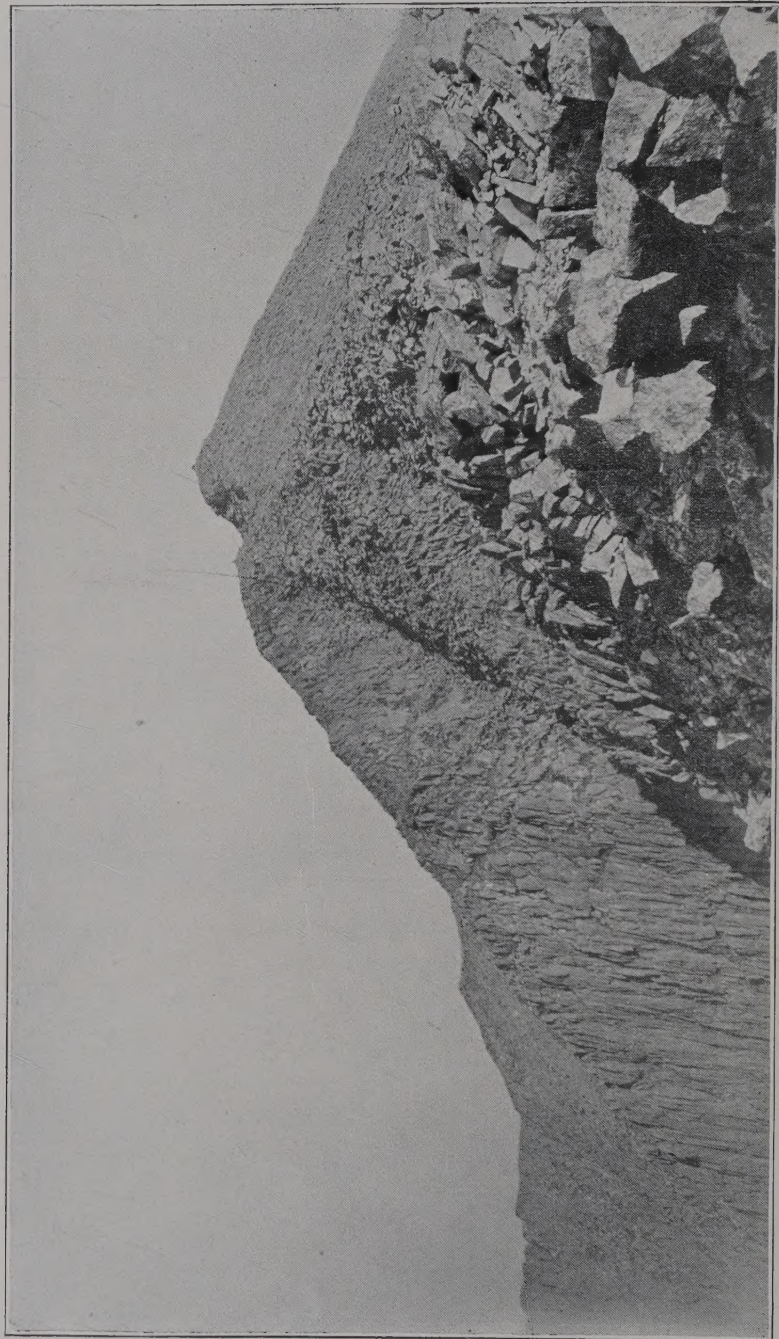
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A BOTANICAL EXCURSION TO MOUNT KATAHDIN.

JOSEPH R. CHURCHILL.

(Plates 25-31.)

DURING the first half of July, 1900, five members¹ of the New England Botanical Club visited Mount Katahdin, Maine. The mountain was a new collecting ground for all of the party, and some account of our exploration and collections will perhaps be interesting to the readers of RHODORA.

Twenty years ago Charles E. Hamlin communicated to the Appalachian Mountain Club a paper² describing Mount Katahdin, its infrequent but notable visitors, and the four possible routes by which they and others reached the mountain. The route taken by us, which was in great part the fourth one described by him, has since been much shortened by the extension of the railroad from Brownville through Stacyville, and doubtless other routes have been rendered more available since he wrote. Nevertheless Mount Katahdin is still surrounded by an immense wilderness, traversed only by lakes and rivers and by roads or trails, which in summer at least, are too rough to attract the tourist; and Mr. Hamlin's observations are true to-day as then, that the mountain "is so inaccessible that practically it is remote even to New Englanders. It is probably true that a greater

¹ Dr. George G. Kennedy, of Milton, Mass.; Merritt L. Fernald, of the Gray Herbarium, Cambridge, Mass.; J. Franklin Collins, of the Botanical Department of Brown University, Providence, R. I.; and Emile F. Williams and Joseph R. Churchill, of Boston, Mass.

² *Appalachia*, ii. 306.

number of eastern men now annually visit Pike's peak than penetrate to the Maine mountain, and a hundred Bostonians have been among the Alps for one who has climbed Ktaadn."

But though few, it was yet a distinguished company that we followed! To do more than refer to some who preceded us would unduly lengthen our report and repeat unnecessarily what they have themselves written, as well as Mr. Hamlin's account of them already referred to.

In the beginning was Charles Turner, Jr. of Boston, "the original describer of Ktaadn," who with guides and seven comrades made the ascent as early as 1804. His account is preserved in the collections of the Mass. Hist. Society. In 1836 came the excursion of Prof. J. W. Bailey, the father of our genial associate and botanist W. W. Bailey, of Providence. Two other distinguished geologists, Dr. Charles T. Jackson in 1837, and C. H. Hitchcock in 1861, made official visits. The enthusiastic eulogy of the mountain by Theodore Winthrop, scholar and soldier, was published after his death in 1861 under the title "Life in the Open Air." Dr. Edward Everett Hale with his friend Mr. Channing, made a partial ascent in 1845, an account of which was printed in the Boston Daily Advertiser. Then came Thoreau, in 1846, and the Rev. Joseph Blake, who, in 1856 discovered near the summit *Saxifraga stellaris*, var. *comosa*. And Dr. Goodale's visit, in 1861, was rewarded by the discovery of another Katahdin plant, *Carex rariflora*, which, however, in some way escaped detection by our party.

The morning of July 3, 1900, saw two of our delegation safely landed at Stacyville, a little country village on the Bangor and Aroostook R. R. We had had several introductory views of Katahdin from the car windows, but it was at the end of the little straggling road that leads from the station to the Post Office, where we stopped a few moments at the brow of the hill, that we first saw the mountain in his grandeur. Here truly was a picture for an artist. At our feet the hill sloped steeply to the West. On the horizon, twenty miles distant, was the great pile stretching along from North to South, crowned with its two peaks or summits and easily distinguished almost to the base from the lower ranges of hills that lay between. Below us stretching away to the mountain and the western horizon was the wilderness, almost unbroken save by the camps and trails of the hunters and logging men. This was the broad flat valley of the

East Branch of the Penobscot, which, eight miles away, flows peacefully southward past "Lunksoos," the camp on its hither shore which we should reach by night, and where we should await the arrival of the rest of our party. In all our trip I recall no other view of or from the mountain equal in beauty to this one from the edge of Stacyville. Here they pointed out to us the great abyss in the Eastern slopes of the mountain, into which above debouched the "North Basin" and the "South Basin," the latter our destination and ten-days' camping site. From the south end of the range there extended toward us the long gaunt and rocky spur tipped by Pomola, the whole spur curving about and embracing the South Basin much as Cape Cod surrounds Massachusetts Bay. Here we saw the southeastern exposure. At our camp we were upon the other, or inner, side. Of course we were much interested in making out these points, and in observing the great patches of snow that still lay there upon the steep slopes.

Our guide, Capt. Rogers, met us at the station with a two-seated buck-board, to take us with our baggage to Lunksoos. No summer boarding-house affair was this buck-board. It was built for substantial service over roads the roughness of which we were now to experience, but which accurately to describe requires that this sketch shall be illustrated with one of the views of a sample passage en route (pl. 26) taken by the artist to the expedition.

Outside the town, at the foot of the long hill I have mentioned, beside a stream where recently had been the inevitable saw-mill, we had our noontide lunch amid *Mitella nuda*, *Ranunculus septentrionalis*, a profusion of *Linnaea*, and other plants common enough here, but very welcome to the unaccustomed eyes of Bostonians. Here also we made our first collection from the Maine soil, a tall *Geranium* which proved to be the *G. pratense*, L., of Northern Europe. We had noticed it by the roadsides as we rode through Stacyville, where it is evidently well established. It is like our *G. maculatum*, but much larger and coarser; the flowers are deep blue-purple and the leaves are cut into very narrow pointed lobes like those of *Ranunculus acris*. The upper parts of the plant are glandular-hairy. Mr. Fernald has also observed it elsewhere in the State, and it is doubtless entitled to recognition in future editions of the Manual.

Just beyond this stream, where the fields come to the forest, a turn-pike gate is appropriately set across the road; and as we closed it be-

hind us we shut out our nearest post office, our railroad station, and civilization, for two whole weeks. We have now, since our return, no difficulty in identifying this point also as that described by Hamlin in his paper (p. 322) where "the way turning directly west . . . the Third of the Sixth (now the plantation of Stacyville) changes from a smooth highway to the worst of cart-tracks." My note for the afternoon says: "We had a rough ride on the buck-board, but it was mostly walking." We walked both for comfort and to botanize.

There is, after all, little collecting to be done (unless one is looking for mushrooms) in the sombre shades of a Maine forest, so we easily kept ahead of the horses, and it was long before sunset that we emerged in a clearing upon the river bank at the "Hunt Place." As it was now raining we sought shelter in the dilapidated old house and waited for the wagon to come up. This same "Hunt Place" was visited by Thoreau, who, on August 1, 1857, came down the river in his canoe, and called at the house. He says "We found that we had camped about a mile above Hunt's, which is on the East bank and is the last house for those who ascend Katahdin on this side . . . We stopped to get some sugar, but found that the family had moved away, and the house was unoccupied, except temporarily by some men who were getting the hay. They told me that the road to Katahdin left the river eight miles above; also that perhaps we could get some sugar at Fisk's, fourteen miles below. I do not remember that we saw the mountain at all from the river."

We too found the Hunt Place as deserted and desolate as did Thoreau more than forty years before, but "the last house for those who ascend Katahdin on this side" was now a mile and a half further up the River, at Lunksoos.

The cart-way along the edge of the river was rougher than the "tote road" just passed, but we were now bundled up in rubber coats and so packed into the buckboard in the rain, that we had to submit to the pounding, which we had before avoided by walking. Capt. Rogers told us that his camp was named from a mountain still further up the river. Thoreau spells the name of this mountain "*Lunxus*," and says the word means "Indian Devil." Whether appropriate or not to the neighboring mountain, the appellation thus translated is wholly out of keeping with the quiet rural beauty of this little riverside home; unless indeed it is intended to suggest the character of the roads by which the paradise is finally reached.



AT THE CAIRN, WEST PEAK, MT. KATAHDIN.

"We had a rough ride on the buck-board, but it was mostly walking."

The camp comprised a two-story frame house with a barn, and at a little distance a sylvan dormitory or hunters' lodge of two stories, built of logs placed perpendicularly and containing eight or ten rooms. The woods were cleared away and a green but "stumpy" lawn sloped gently from the house to the river bank a few rods below. The thick forest bordering the opposite bank of the river was reflected in the smooth dark water, though above and below were rapids, and the picture was not there so restful. A wire cable with its primitive ferry-boat, connecting the banks, added a picturesque feature to the landscape. While Katahdin, as Thoreau said, was not visible from the river, yet from the little observatory upon the roof there was a good view, though much obstructed by clouds about its head, and (it must be confessed) by other clouds about ours; for there we found that the black flies were particularly numerous and aggressive. So we did not much frequent the roof-top, but made ourselves busy comfortable and at home in many ways below.

The next day, July 4th, we transferred almost all the contents of our neatly packed trunks to large rubber or canvas bags and in other ways mobilized our forces. We watched the swallows building their nests along the eaves of the low piazza, quite within reach. In a canoe ride up the pretty river at sunset we made our first acquaintance with a moose who was feeding in a wet meadow. He soon made off into the woods, however, looking upon us undoubtedly, in common with all mankind, as his foe. He could not know that we were not collecting moose! We walked back down the river road to Hunt's again, and along the bank collected *Carex torta*, *C. arcta* and *C. tribuloides*, vars. *turbata* and *reducta*. In the woods we found *Habenaria Hookeriana*, *Viola Selkirkii*, *Pyrola chlorantha*, and *P. asarifolia*.

Tuesday evening, July 5, brought Collins, Fernald and Williams. Our party was now complete; and, after they had gone through the same demoralizing process of dumping blankets and clothes from the open and luxurious trunks to the dark cavernous recesses of canvas bags, we were ready for the start the next morning.

The Wassataquoik River drains the Northeast slope of Katahdin and empties into the East Branch above Hunt's. It is at this season a shallow, brawling mountain stream, and before the despoiling hand of the lumberman, followed by the usual visitation of forest fires, it and the valley through which it flows, must have been a scene of

surpassing beauty and wildness. Now, while much of its former beauty remains, yet, in its ascent, we travelled the greater part of the way through an open rough and rocky country, from which the protecting forest had been almost entirely removed by the axe and by fire. Thus "progresses" everywhere the Maine wilderness. Some big primeval woods through which we climbed, well up Katahdin's side, hitherto saved by their remoteness and inaccessibility, were, it was said, already doomed, and the trunks of these black spruces were this winter to follow their mates down the yearly diminishing current of the Wassataquoik to the saw mills. Some benefit however, from all this havoc had we in the logging camps, which derive their existence from this industry and which, at intervals each of several miles along our path, afforded us rude shelter and hospitality on our two days' journey to our own "Camp Kennedy."

Two buckboards took us by the little wire ferry across the East Branch. At the outset we had a particularly exciting and boisterous passage through the low wet bottom lands which lay along the west bank. It was wet and miry, and as the mire was invariably much deeper on one side than the other, the center of gravity of our wagons was often dangerously near getting outside the base, and the woods rang with our shouts of alternate laughter and terror dependent upon which side at the moment was up and which down, ours or the other fellow's.

Walking was here out of the question; there was too much water; so we stuck to our seats, observing the driver's direction, "Just get your heft under you, then set on it"; but we rejoiced when after a mile we reached the dry land. Passing over the ridge between the two rivers we struck the Wassataquoik at Dacey Dam. Thence our path lay along the left bank of the river, very gradually ascending. At noon we lunched at "Robar's," and before sunset, after some steeper grades and climbs, we reached the "Bell Camp" at the head of navigation for wheels.

The log house was prettily situated above the steep river-bank. We had come that day about sixteen miles, and had acquired good appetites. There were trout in the river, and some of the party, instead of botanizing, undertook to provide for supper, with very good success. A notable collection was made en route in *Listera auriculata*, which grew in low ground by the river.

Before stretching ourselves, some in bunks and some on the

equally comfortable log floor, we went through a most salutary and disciplinary exercise in recovering from the depths of those bags just the few things that we needed for the night, while the others slid to the bottom. The sense of touch was the only one involved in the transaction, but at these times a feeling akin to despair took possession of us, wondering how many of our worldly possessions there would remain to us the next night and the next.

Here, early the next morning, Saturday, July 7, we crossed and left the Wassataquoik, and ascended a narrow valley through which flows a tributary brook. After an astonishing ford of the rocky rushing river by the horses and buck-boards, our camp equipage was transferred to a "jumper," or rough lumber sled, which, drawn by two horses, followed us to the "McLeod" Camp, two miles beyond. Here one of the mountain thunder storms, which were afterwards of almost daily occurrence, overtook us, and we were glad to get under cover of the rude cabin.

Striped squirrels, "chipmunks," ran about in the cabin and upon me as I sat in the open doorway. We were grieved to hear afterwards that they had all been slaughtered. Poor tame little creatures! They get in the way of man, the bigger animal; they eat some of his pork and beans; straightway they are classed as pests, and become a target for the revolvers of cruel hunters and guides, who indeed seldom wait even for this excuse for gratifying the passion for slaughter. We saw many deer throughout the trip and wondered how men could get pleasure in slaying the beautiful and harmless creatures.

At McLeod's began the real ascent. Even the horses and the jumper stopped here. To our camp in the South Basin, there was only a "trail" through the forest, with the blazed trees by which to follow it, with care. Our lithe and sturdy guides made the climb more easily I think than we, though they carried most of the baggage, sometimes eighty pounds apiece, on their backs. The length of this stage was fully five miles, though I have an impression that these same guides diplomatically assured us that it was but three. When we reached Depot Pond after many hours of climbing, we fondly imagined that we were near the top, but when we came down over the same trail, we found this pond a long way from camp!

It was now again raining; we were wet, and the air and the mossy earth and forest and everything about us was drenched; yet when at

last we stumbled upon our long-sought Camp Kennedy, it was not without a feeling of surprise, to find it there, imbedded in the apparently unending forest. We were looking first for "scrub" perhaps; or a limit of trees; something in the nature of a clearing. Yet, newly constructed from the unpeeled spruce logs that grew on the spot, with low flat black roof, it seemed part of the forest itself and quite a normal growth there. A most artistic chimney upon one side of the structure, though made of green spruce bark in keeping with the rest, betrayed more clearly its artificial character; and the smoke arising therefrom gave promise of a fire, of comfort, and of dry clothes within; an invitation we were not slow in accepting. The inside was much like the outside. It was a single room about twenty feet square, with flat roof about nine feet from the floor on one side, sloping to perhaps seven on the other. The floor was made also of smaller logs, laid unhewn upon or just above the ground, like a corduroy road and about as level. There was a door about two feet wide in front, facing South, and opposite to a window with a glazed fixed sash about three feet square.

On one side the logs were interrupted for a space in the middle, to take in the fireplace which was built outside and of stones, but the chimney itself was built down close to the fire of thick spruce bark; and, though exciting our instant admiration as a work of art, became from day to day more inflammable and dangerous, and was, despite the humidity of the climate, several times on fire. Such construction would never have been approved by our Boston Inspector of buildings. Opposite the fireplace, in the corners, were two bunks raised perhaps four feet from the floor and built of small trunks or poles; and beneath them, on the ground, two more bunks. The bedding was spruce twigs, imbricated. For furniture we had a table made of spruce bark, with sections of the logs for seats. I dare say that I have described too particularly a typical log cabin of the Maine woods, but it may be new to some of the readers of RHODORA, as it was to some of us.

Except the glass sash, the roof was the only part of our house which was imported, and we had much trouble with it, though perhaps not for that reason. It was made of rolls of tarred paper slightly overlapped; and the pitch, but two feet in twenty, was so slight that frequently the rain trickled through into our sleeping nests and upon our dryers, instead of going off by the eaves as it shoul



TIMBER-LINE ABOVE CHIMNEY POND, MT. KATAHDIN.

It was but a frail barrier between us and the clouds, when some of the deluges came at night, and then we were glad we were under the trees and not on the exposed lakeshore near by, where the wind roared and would surely have torn our paper roof to tatters.

We were now well up in the South Basin on the east slope of Mount Katahdin, at an altitude of about 3000 feet. This Basin may be roughly described as bounded west and south by the steep wall and uppermost slopes of the mountain itself, north by a spur extending eastward from the mountain between the so-called North and South Basins, and southeast by Pomola, connected with the rest of the mountain by a most remarkable arm or promontory, a narrow precipitous and desolate mountain wall. The monument or southern peaks, which are the highest, and therefore the summit of Katahdin, are precisely where this narrow wall separates from the broad upland.

At the foot of the concave and ragged slopes of Pomola and this narrow connecting ridge, in front of the Camp and but a few rods away, was a little alpine lake, bordered in part by a narrow bog and in part by giant boulders, sometime parcel of the heights above. About this tarn, Chimney Pond, were collected many of the good things for which we came, notably *Carex saxatilis*, concerning which Mr. Fernald has elsewhere¹ given a particular account of his investigations and conclusions. In its icy waters, just below its outlet, grew *Salix balsamifera* and *S. phylicifolia*.

Along the brook, which flowed by the Camp, we found flowering *Viburnum pauciflorum*, and *Pyrola minor* which we coaxed into flower before we departed.

Sunday, July 8, the day following our arrival, was a day of idleness enforced by the continual downpour of rain though it is recorded that neither weather nor want of appetite interfered with our keen appreciation of dinner, which included a first rate stew of beef, potatoes and onions served in porringers. Dessert, flour biscuits with maple syrup, in tin plates. It was probably before this meal that we improved our view of the great cliffs and of the summit by cutting down some fir-balsam trees which grew beside the camp.

The next morning, July 9, gave promise of no better weather, but something was to be done, rain or shine, and Fernald, Collins and

¹ RHODORA, iii. 44.

the writer started up the rocky bed of the brook to explore. After a mile or more we were out of the woods, the brook and its bed disappeared, and we found ourselves ascending the steep slope of the mountain (which on this side forms a wall of the Basin), and absorbed by the alpine plants which grew profusely about. I think the rain still continued at intervals, but it made no difference. They were April showers which only made the flowers brighter and more beautiful.

The Heaths were conspicuous and almost all in flower. *Cassiope* was there with delicate mossy stems and white flowers. The rosy nodding flowers of *Bryanthus* were profuse and attractive. *Loiselcuria* was perhaps as abundant, but less conspicuous. There were on the ledges the curious convex tufts of the *Diapensia*, with even surface, but with large white flowers projecting, like pins and ornaments from a pincushion. Of the *Vacciniums* we collected *V. Vitis-idaea*, *V. uliginosum* and *V. caespitosum*. We found *Viola palustris* here and at other points, always with flowers white.

Near the top of the ascent or slope we stopped to drink from a cold spring. Here we collected *Lycopodium sitchense*, and *Salix herbacea* with the little staminate catkins just in flower. *Alnus viridis*, too, was just expanding its staminate catkins. But as usual the Alpine *Rhododendron* had gone by thus early.

These slopes, up one of which we thus climbed, come to a distinct termination and are succeeded, at a step, by a nearly level upland grassy or sedgy plateau between the North and the West Peak or summit. The edge of this plateau and the adjoining upper slopes were fairly carpeted with *Arctostaphylos alpina*, which was very full of green fruit. It was not late when we reached this "Saddle," and we could easily have gone to the summit, but we preferred to take another day for that. So we ate our lunch, wandered about over the great plain, enjoying the view and the strong fresh wind which came out of the West, and made our way down a neighboring slope, which had been recently converted into a "Slide," and thence by way of the brook, seasonably and triumphantly to Camp.

The next morning, Tuesday, July 10, some of the party thought that they discovered assuring signs of fair weather and started for the summit, but toward noon it rained as hard as ever, and the afternoon was spent in camp. With our load of plants already collected there was plenty there to keep us busy.



Negative loaned by Prof. L. H. Merrill.

SOUTHERN EDGE OF THE TABLELAND, MT. KATAHDIN.

THE SADDLE FROM NEAR THE CHIMNEY, MT. KATAHDIN.

Wednesday, July 11, we were more fortunate. We got away early, followed the brook as before, but left it and ascended to the Saddle by way of the Slide, which was on the whole easier than working and climbing through the rocks and scrub on the adjoining ledges and slopes. From this point, the top of the west wall of the Basin, the ascent is wonderfully easy. The great Tableland stretches away to North and South, very irregularly bounded by the various ravines and precipitous slopes, and often covered with loose rocks and boulders, but rising very gradually to the two peaks.

We were soon widely scattered over this lawn, looking at the grand view and trying to name the various lakes and mountains which made up the panorama, and collecting a few grasses and other plants; but we finally got together at the stone cairn at the top about midday. We were here more than 2000 feet higher than our camp, whose location we could readily discern; and according to the most accurate survey, 5215 feet above sea level. It was then clear, though clouds were beginning to drive in from the West, and the view in all directions was very beautiful. The numerous large lakes, and the rivers, too, whose courses were easily traced, gave a variety to the landscape which is wholly wanting in the view from the summit of Washington.

Here at the cairn, marking this summit, ends the great mountain plain, up which we had comfortably walked, and the end is very abrupt. Looking East, we are close to the ragged edge of the fearful precipices which fall hundreds of feet to the little lake at our camp below. Turning but a quarter-circle to the South, the drop was almost as abrupt; save that between the two descents is the dizzy path which leads down and along the narrow ridge over the Chimney to Pomola, here making off from the mountain, first to the East and then at a sharp angle to the North; embracing, as I have said, the South Basin in its great curve. It was a scene of desolation! Were it not that the granitic formation forbade that conclusion, we might think ourselves on the ragged edge of the crater of an extinct volcano. The rocks were broken and disintegrated.¹ The cliff

¹Prof. R. S. Tarr, in his paper on "Glaciation of Mount Katahdin, Maine" (Bull. Geol. Soc. Am. xi. 441), compares these steep walls, only recently exposed to the fierce action of frost, water and wind, with similar steep valleys in Greenland, in which glaciers now exist, and from this and other significant evidence he concludes that these Katahdin Basins were until recently the beds of local glaciers.

seemed ready to fall of itself, it was so rotten; and this being remarked, our guides, as cool of nerve as they were agile and strong in body, proceeded, standing upon the uncertain and dizzy brink, to detach great masses which we heard dash and bound from cliff to cliff, carrying hundreds of other portions with them in their wild descent. The spectacle was more safely witnessed by our camp attendant below, who said the rocks did not rest till they reached the little belt of shrubbery above the lake.

We had now again crossed the path of Thoreau, who, in September, 1846, ascended the mountain, from the west side, though by reason of bad weather he did not get quite to the summit. Some of his observations are so appropriate and accurate that I venture to quote them:—

“At length,” he says, “I entered within the skirts of the cloud which seemed forever drifting over the summit, and yet would never be gone; but was generated out of that pure air as fast as it flowed away; and when, a quarter of a mile farther, I reached the summit of the ridge, which those who have seen in clearer weather say is about five miles long, and contains a thousand acres of table land, I was deep within the hostile ranks of clouds, and all objects were obscured by them.

“The peculiarities of that spacious table land on which I was standing, as well as the remarkable semi-circular precipice of basin on the eastern side, were all concealed by the mist.

“The tops of the mountains are among the unfinished parts of the globe, whither it is a slight insult to the gods to climb and pry into their secrets, and try their effect on our humanity. Only daring and insolent men, perchance, go there. Simple races, as savages, do not climb mountains,—their tops are sacred and mysterious tracts never visited by them. Pomola is always angry with those who climb to the summit of Ktaadn.”

Two of our party (Fernald and Collins) decided to risk further the anger of Pomola by scaling the narrow and difficult path along the ridge over the Chimney and thence returning home over the brow of Pomola, with a guide. We watched them from the summit, and it was surprising how far away we still saw them through the clear air; and we exchanged signals when they looked no bigger than flies. Pomola launched no thunderbolts upon them that day and they reached camp safely after a long and precipitous descent. The



POMOLA FROM THE TABLELAND, MT. KATAHDIN.

GREAT BASIN FROM NEAR THE CHIMNEY, MT. KATAHDIN.



NORTH BASIN OF MT. KATAHDIN FROM DEPOT POND.

SOUTH BASIN OF MT. KATAHDIN FROM DEPOT POND.

return of the rest of the party was by the Slide again, but on leaving the summit we kept together along the edge of the Basin, partly to watch the *Pomola* delegation.

Now we all knew that somewhere near the summit "on wet rocks" there had been collected by Scribner in 1873 *Saxifraga stellaris*, var. *comosa*. So the eyes of both sections were now particularly engaged in discovering the hiding places of the little stranger, whose only station in the Eastern United States was near where we then were. And to Williams is due the credit of first finding her, and of tearing her ruthlessly from her damp bed under the dark rocks. Being thus advised, however, the others soon found victims in similar unwholesome retreats and though the supply was limited, our Club and private herbaria at least will have a satisfactory representation of the rarity.

The daily rain now began to fall and the summit and *Pomola* were as invisible as they were to Thoreau, but we had done with them and were ready to return to shelter after a most satisfactory day.

Friday, July 13, we followed two guides and a trail through the woods and over the intervening spur, into the North Basin. We found after struggling through the "pucker-brush" which formed an almost impassible barrier before it, or across the great opening to the East, that it was a most interesting place. The altitude of its floor was about 500 feet higher than that of the other Basin; and there were no trees except in the depressions, where as usual the scrub made progress difficult. It was a great open amphitheatre, bounded, except on the East, by a series of perpendicular almost inaccessible cliffs which rose to the summit plateau. These cliffs were more regular, and not so high nor so utterly desolate and suggestive of the action of violent forces, as those which towered over our little camp in the South Basin. From their base the ground sloped quite gradually and uniformly to the narrow lake, perhaps a third of a mile long, which extended partly across the great eastern opening. To travel about and to pass across this little sheet of water was very difficult on account of the rocks and the jungle of low spruces and dwarf birches and alders which surrounded it. Beyond, the floor was carpeted with *Cornus Canadensis*, the common alpine *Vacciniums* and *Willows*, and with spreading mats of the Alpine Bearberry heavily laden with fruit. *Comandra livida* was not uncommon, but it did not emulate the example of its prolific neighbor, and as usual confined itself to a very meager production of flowers and fruit.

A wet slope between two of the cliffs gave us *Castilleja pallida*, var. *septentrionalis*, *Juniperus communis*, var. *nana*, *Carex atrata*, var. *ovata*, *Avena striata*, *Agropyron violaceum*, *Cardamine bellidifolia*, *Potentilla fruticosa* and *Galium Kamtschaticum*.

Monday, July 16, we broke camp and started upon our return down the mountain by the same path. I do not recall that on that day we had rain before late afternoon, but certainly on the day following, when we rode from the Bell Camp to Lunksoos, there came a flood; and we were compelled again to remain in the open wagons rather than wade through many pools and swollen brooks. In skirting the edge of the "Depot Pond," and at some other places, we collected some notable Carices; and along the gravelly bank of the Wassataquoik we saw much *Prunus pumila*, quite unlike our Sand Cherry of Massachusetts, *P. cuneata*, with which it has been confused.

Tuesday night we reached Lunksoos, which now seemed a most luxurious abiding place. Thence by way of Stacyville, through farewell torrents of rain, submerged forests and corduroy roads, our little party dispersed, in the diverse directions in which pleasure or duty called.

A COMPARISON OF THE FLORAS OF MT. WASHINGTON AND MT. KATAHDIN.

EMILE F. WILLIAMS.

MT. KATAHDIN lies 161 miles northeast of Mt. Washington. The latitude of its highest summit, the West Peak, is $45^{\circ} 53' 40''$. The latitude of Washington is $44^{\circ} 16' 25''$, a difference of $1^{\circ} 37' 15''$, about 112 miles. The altitude of Mt. Washington is 6300 ft. above the sea; the most reliable determination of the altitude of the West Peak of Katahdin, made by Prof. M. C. Fernald, gives it a height of 5215 ft. above sea level. Both mountains have a similar geological formation, almost entirely granitic.

As might be expected, the general conditions for plant life are very similar on these mountains. Both are surrounded by vast areas of wooded country, both are abundantly watered by innumerable springs and rivulets, which well up out of the ground at very great elevations and both ranges are sufficiently high and extensive



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HEAD OF NORTH BASIN, MT. KATAHDIN.

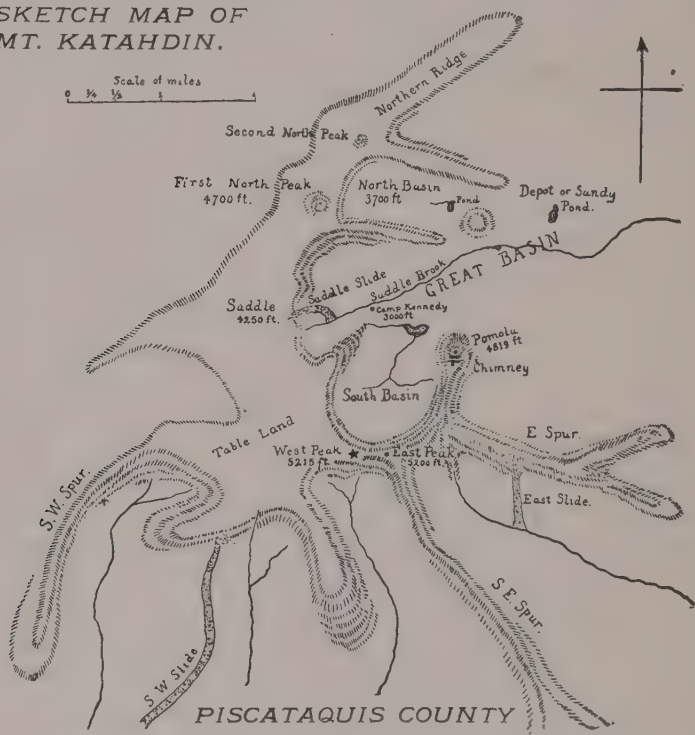
to possess a considerable subalpine and alpine region. On the summit ridges of both the botanist can revel in miles of the stony wastes and upland bogs that yield the rare treasures of high mountains, while his spirits are uplifted every time he raises his eyes from the ground by the soul stirring scenery displayed before him on all sides. Indeed, if the botanist be a mountain lover as well,—and what botanist is not,—he will prefer Katahdin for its ruggedness, its summits as yet undefiled by the handicraft of man, and its magnificent panorama of numberless lakes and streams, in which last feature it is conspicuously superior to Washington.

While the general conditions of both mountains are alike, Katahdin differs from Washington in many minor particulars. It is distinctly more arctic, for one thing, although it is only 112 miles more northerly. The timber line, which on Washington averages 4000 ft. altitude, barely averages 3100 ft. in the Great Basin of Katahdin and 2200 ft. on the southern slopes; this last being partly due, however, to their excessive steepness. The entire summit ridge in fact, while in the greater part of its length somewhat flat, falls away precipitously on all sides. There being no easy grade to the summit of Katahdin, like the Fabyan ridge or the Crawford range of Washington, the flora of its slopes is found in scantier patches, the plants themselves being smaller and more stunted than on the latter mountain. Prevalent as are the fogs and abundant as is the precipitation on Washington, Katahdin appears to be an even wetter mountain. This is probably due to its isolation. It lies alone in the vast Maine wilderness, except for some ranges of lesser mountains to the North and Northwest, so that clouds form freely about its summits. We can generally count on good collecting weather on Washington in July; on Katahdin, not until August according to the guides. We were on Katahdin from July 8th to July 17th and it rained every day but one. During a ten days' stay in the immediate neighborhood, in February of this year, the mists gathered over the summits every day, pouring snow into the ravines, just as they had poured rain over us last summer. The local guides assured us that snow reaches a depth of eighteen feet in the Great Basin, where our camp was located,—truly an arctic condition of things!

The summit ridge or backbone of Katahdin, as will be seen by a glance at the accompanying map, is shaped like a huge fishhook, the shank of which lies toward the Northeast and the opening of the

hook to the east. The two highest summits, the West and East Peaks, which differ in altitude about 15 ft., and are about one third of a mile apart, are at the base of the hook. The point of the hook, which turns north from the East Peak is terminated, first by a little tower-like crag called the Chimney and then, across a deep and narrow notch, by a precipitous peak called Pomola (4819 ft.) named

SKETCH MAP OF MT. KATAHDIN.



from the Indians' demon of the mountain. Pomola according to them is responsible for the bad weather with which the intruding mountain climber is assailed, this being the divinity's method of showing his displeasure at the invasion of his domain. Beyond the West Peak (5215 ft.) the ridge curves in an arc of a circle to the North Peaks, of which there are two close to each other. The depression between the West Peak and the North Peaks (4700 ft.) is called the Saddle, the lowest part of which is at 4250 ft. altitude. The Tableland lies between the West Peak and the Saddle, and is

an almost plane surface, inclined to the northwest at an angle of from five to seven degrees and having a length of a mile and one half, with an area of more than five hundred acres. It is a botanical garden of the most generous proportions.

Beyond the North Peaks, the ridge continues at a lower level for three miles and then it drops abruptly into the foot-hills, which are heavily wooded. The entire length of this ridge above timber land, is eight and one half miles. The inside of the hook forms the Great Basin, an elevated ravine at an average altitude of about 3000 ft., three miles long from North to South by one and one half miles wide from east to west. Under Pomola and the East and West Peaks, the walls of this Basin are well nigh vertical and form a smaller amphitheatre of sublime proportions, with a northern exposure, called the South or Chimney Basin within which is a small lake called Chimney Pond. Near the mouth of the Great Basin on its west side, two secondary ridges three quarters of a mile apart, which abut on the main ridge on either side of the North Peaks, form an elevated ravine with a southeastern exposure called the North Basin. The floor of this North Basin is barren of timber, its elevation, about 3700 ft., is several hundred feet greater than that of the South Basin and the conditions for plant life are similar to those on the summit ridge.

The back wall of this ravine is very wet and being exposed to the sun and less steep in most places than the back wall of the South Basin, it afforded us almost the best collecting ground we found on the mountain.

It is not as yet possible to make an accurate botanical estimate of the flora of Katahdin. The range is so vast that many seasons will be required before we know approximately the bulk of its flora. Our survey embraced only some of the main features of the mountain; the two Basins and their walls, the summit ridge from the Saddle around to Pomola, including a part of the Tableland with the West and East Peaks, and a limited area about the North Peaks. We could do nothing on the vast outer slopes of the hook, nor on the long Northern Ridge.¹ The roughness of the work and the great

¹ A large basin, as yet little known, has been seen by explorers from the Sourd-nahunk range (to the northwest of Katahdin). This basin lies in the western wall of the North Mt., and is reached with extreme difficulty from above. Those who have explored it report a deep abyss surrounded by precipitous walls, and with a pond in its floor fed from above by a high waterfall. Owing to lack of definite data this basin is not represented on the accompanying map.

distance from a base of supplies, make a thorough botanical exploration of the whole mountain a labor of many years. We noticed however with interest, on the one hand the presence of many plants not found on Washington (several being species new to Maine) and, on the other, the unaccountable absence of species common enough on that mountain. It is more than probable that most of these will turn up in time. Our work was confined to the alpine and sub-alpine region of the mountain and it is this region only that we consider.

Perhaps the most notable plant peculiar to Katahdin is *Saxifraga stellaris*, L., var. *comosa*, Willd. This was found in Joseph Blake's and in Scribner's original stations, the latter in the interstices of great rocks north of the West Peak, the former in the notch between the Chimney and Pomola, where a few specimens only were collected by Mr. Fernald.

On the eastern slope of the Saddle, Mr. Fernald collected an immature *Epilobium* which appears to be with scarcely any doubt *E. anagallidifolium*, Lam. In the North Basin we collected an abundance of *Comandra livida*, both in flower and fruit. This has been found hitherto in New England only on Mt. Mansfield in Vermont and on Saddleback and Abraham in the Rangeley Lakes country. Singularly enough a very dwarf *Kalmia angustifolia*, with flowers of the brightest hue, abounds there. On Washington we have never seen it, except on the foot-hills. We also found in the North Basin, *Larix Americana*, a few trees, absolutely prostrate, but spreading over ten or twelve feet scarcely six inches from the ground. *Juniperus communis*, var. *nana*, Loud. (the first station in the eastern United States) and *Eriophorum alpinum* are on the ledges of the back wall. This back wall, in fact, was especially rich in low-land plants, which owing to the dampness and southeastern exposure attain here a remarkable elevation. Many of these were found at 4000 to 4500 ft. altitude. We noticed among the members of this adventurous colony: *Lycopodium clavatum*, *Osmunda Claytoniana*, *Pteris aquilina*, *Carex leptalea*, *Carex communis*, *Carex flava*, *Danthonia spicata*, *Smilacina racemosa*, *Andromeda polifolia*, *Aster umbellatus*, *Aster Radula*, *Aster acuminatus*, *Diervilla trifida*, *Potentilla fruticosa*, *Prunus Pennsylvanica*, *Prunus Virginiana*, and *Viola Selkirkii*. It seemed strange indeed to find these plants in company with *Diapensia Lapponica*, *Bryanthus taxifolius*, *Arnica Chamissonis*, and *Epilobium Hornemanni*.

Three interesting *Carices* we found on Katahdin, and although two were well below the alpine region, we cannot pass them in silence: *Carex Grahmi*, Boott, the second reported station in the United States, and *Carex Katahdinensis*, of Fernald, a new species. Both of these were found at Depot or Sandy Pond, a tiny mountain tarn, at an elevation of possibly 2500 feet. The other noteworthy *Carex* ~~as~~ *C. saxatilis*, L., at Depot Pond, but more abundant by Chimney Pond, in the South Basin. These are its first known stations south of northern Labrador. was/

We failed to find on Katahdin the beautiful large flowered form of *Houstonia caerulea*, which is so conspicuous on the summit ridge of the Presidential range. *Oxyria digyna*, likewise, was absent, also *Carex capitata* and *Carex capillaris*. Why *Geum radiatum*, var. *Peckii* did not greet us with its large yellow flowers is hard to understand as it is very common in the White Mountains. *Potentilla frigida*, also, remained peculiar to Mt. Washington and Mt. Lafayette, nor did we find *Rubus Chamaemorus*, *Silene acaulis*, *Saxifraga rivularis*, *Sibbaldia procumbens*, *Eriophorum vaginatum*, *Isoetes lacustris*, *Rhinanthus Crista-galli*, and *Angelica atropurpurea*.

One noteworthy plant, *Arctostaphylos alpina*, which is with rare exceptions sterile on Mt. Washington, although it flowers freely, we found on Katahdin in several stations, loaded with heavy clusters of ripening fruit. This was indeed a glad sight to botanists accustomed to spend many hours, turning over the creeping shoots in search of one single berry.

The usual high mountain plants, *Cassiope hypnoides*, *Loiseleuria procumbens*, *Rhododendron Lapponicum*, *Bryanthus taxifolius*, *Arnica Chamissonis*, *Diapensia Lapponica*, and many other old friends, greeted us in their freshest apparel and these showy beauties elicited the greatest appreciation from our guides, who although familiar enough with the mountain, had hitherto been blind to their presence. Our more sophisticated spirits were far more elated by the humble *Gnaphalium supinum*, the lowly *Comandra livida* and the shy little *Saxifraga stellaris*, var. *comosa*.

"The daintiest last, to make the end most sweet."

THE VASCULAR PLANTS OF MOUNT KATAHDIN.

M. L. FERNALD.

(Plate 32.)

AMONG the numerous scattered accounts of Katahdin there are few detailed lists of the plants. In fact, many who have written of the mountain seem to have noticed only a few common species, while others have contented themselves with vague or unfounded generalizations. Besides those who have written on Katahdin there are, of course, a number of people who have there picked up plants of more or less interest. But so far as is now known to the writer the results of only two serious botanical trips are unrecorded. These will be discussed in the following summary which attempts to show our present knowledge of the more important botanical explorations of Mt. Katahdin.

In 1837, Prof. J. W. Bailey published in the *American Journal of Science* (xxxii. 20-34) an account of his geological studies on the mountain. Several plants were enumerated, mostly from the base or the lower slopes.

Thoreau, whose vivid account of the mountain can be appreciated only by those who like him have pulled themselves "up by the side of perpendicular falls of twenty or thirty feet . . . ascending by huge steps, as it were, a giant's stairway, down which a river flowed," noted, in 1846, many of the common species, but the unpropitious weather prevented his exploring extensively.

In August, 1847, George Thurber, the distinguished agrostologist, Aaron Young, a student from Bangor, and John Emerson of Glenburn, Maine, ascended the mountain and made extensive collections. No report of their results seems to have been published, though a large number of specimens, both from Thurber and from Young, are in the Gray Herbarium. Their route seems to have been the old one by the Wassataquoik valley, thence to Katahdin Lake and up the East Spur. Though they brought back the first representative collections of Katahdin plants they apparently got none of the rarer species, and the data on their labels are unfortunately incomplete.

"Parson" Keep, the veteran guide and independent pastor of a faithful flock, whose unique but intimate knowledge of Katahdin and the flora of northern Maine was transmitted to no successor, knew

the plants in their alpine homes. Upon his observations and guidance depended many of the results accomplished by the Scientific Survey of 1861, but apparently no more definite record exists of his botanical knowledge of the mountain.

Joseph Blake, whose Fourth of July, 1856, was celebrated by the discovery of *Saxifraga stellaris*, var. *comosa*, previously unknown south of extreme Arctic America, apparently left no detailed account of his trip, though his herbarium is preserved at the University of Maine, and many scattered Katahdin records are based on his plants.

In 1861, during the Scientific Survey of Maine, two parties visited Katahdin. The first of these, with "Parson" Keep as guide, consisted of C. H. Hitchcock, G. L. Goodale, A. S. Packard, Edmund H. Davis, and a Mr. Maxwell. They ascended by way of the Eastern Spur, thence to the Chimney, the Monument peaks and the Tableland, and from there to Chimney Pond. The other party, consisting of John C. Houghton and G. L. Vose, made the ascent in September, by the Southwest Slide. Many of the plants collected by these parties are enumerated in the report of the Survey for 1861, while others are specially indicated in the Portland Catalogue, prepared by Prof. Goodale and the late Rev. Joseph Blake. Most of the specimens, stored temporarily in Portland, were destroyed by fire, though a very few are still extant.

In August, 1873, and again in 1874, a party from Orono and Bangor, under the leadership of M. C. Fernald, and with F. Lamson-Scribner as botanist, ascended by the East Spur. The botanical results of these expeditions were published several years later by Prof. Scribner in the *Botanical Gazette* (xvii. 46-54) and most of the specimens are in the herbarium of the New England Botanical Club.

In August, 1892, another party from the University of Maine at Orono, with the late Fred P. Briggs as botanist, ascended the North wall of the North Basin to the North Summit, thus exploring almost if not quite virgin territory. The results of this trip were enumerated by Mr. Briggs in the *Bulletin of the Torrey Botanical Club* (xix. 333-336), but unfortunately without special indication of stations.

In 1895, Prof. Alfred B. Aubert of Orono published in *Le Diatomiste* (ii. 211) a list of Diatoms from Katahdin, collected by Prof. L. H. Merrill.

In September, 1898, another large party from Orono with several

botanists, the late Francis L. Harvey, his son, Le Roy H. Harvey, Elmer D. Merrill, and P. L. Ricker, under the able escort of Capt. Rogers and his sons, entered the Great Basin by way of the modern Wassataquoik trail. It was too late for good botanizing, but a few novelties were found. These were recorded by Mr. Merrill in RHODORA (i. 185, 186), his "Three Ponds" probably being the upper of the three, which for convenience and clearness is here designated as Depot Pond.

The account of the most recent botanical explorations on the mountain is contained in the articles which accompany this. In order to bring to date such information as we now possess concerning the higher plants of Katahdin, all publications known to the writer have been examined and their records carefully noted. In the following list, if no authority for the report is given, the statement is based upon observations made in 1900 by the writer and his companions. A single asterisk (*) before the name indicates that this is the first record (at least in a published list) of the species or variety from Maine, while two asterisks (**) indicate that the plant has not been previously recorded from New England.

VASCULAR PLANTS NOTED IN THE BASINS (ABOVE DEPOT POND)
AND ON THE UPPER SLOPES OF KATAHDIN.

Osmunda regalis, L. Margin of Depot Pond. On July 16, the delicate young fronds were 1 or 2 dm. (4 to 8 in.) high.

O. Claytoniana, L. By brook, Southwest wall, North Basin, altitude about 1230 m. (4000 ft.).

Aspidium aculeatum, Swartz, var. *Braunii*, Doell. Rocks in the Great Basin (*Goodale*).

A. spinulosum, Swartz, var. *dilatatum*, Hook. Common in woods; following brooks nearly to the crest.

Phegopteris polypodioides, Fée. Common under spruces.

P. Dryopteris, Fée. Common under spruces.

Pteris aquilina, L. Shelves at 1230 to 1385 m. (4000 to 4500 ft.) North Wall, North Basin.

Lycopodium Selago, L. Very common on shaded cliffs, descending to the shores of Depot Pond.

L. lucidulum, Michx. Common in woods on lower slopes.

L. obscurum, L., var. *dendroideum*, D. C. E. Infrequent in woods, Great Basin.

L. annotinum, L., var. *pungens*, Spring. Katahdin (*Blake*); Eastern Spur (*Scribner*); North Mt. (*Briggs*).

** *L. sitchense*, Rupr. North Mt. (*Briggs*); near head of Saddle Brook and on the eastern edge of the Saddle.

L. clavatum, L. In woods, Great Basin.

** *L. clavatum*, L. var. *monostachyon*, Hook. Fl. ii. 267. North wall, North Basin, at 1230 to 1385 m. (4000 to 4500 ft.).

Isoetes echinospora, Durieu, var. *Braunii*, Engelm. Depot Pond (*E. D. Merrill*).

Larix americana, Michx. Few depressed wide-spreading trees near the head of the North Basin, alt. about 1140 m. (3700 ft.).

Picea nigra, Link. Abundant on the lower slopes, becoming dwarfed and excessively tangled and depressed on the upper slopes of the Basins.

Abies balsamea, Mill. Common, ascending to the crest.

Thuja occidentalis, L. Depot Pond.

** *Juniperus communis*, L. var. *nana*, Loud.¹ Shelves at 1230 to 1385 m. (4000 to 4500 ft.), North Basin. Collected in flower on the West wall, July 13; in nearly mature fruit on the North wall, July 14.

Taxus canadensis, Willd. In woods, Great Basin.

Hierochloë alpina, R. & S. Katahdin (*Blake*); "Saddleback," Eastern Spur (*Scribner*); South wall, South Basin; near Monument peaks.

Phleum alpinum, L. North Mt. (*Briggs*).

Cinna pendula. Trin. North Mt. (*Briggs*); West wall, North Basin, alt. 1230 m. (4000 ft.).

Agrostis rubra, L. Common, descending far below Depot Pond (to the McLeod Camp). Named by Prof. Scribner.

* *A. Pickeringii*, Tuck. Common, descending to woods in the Great Basin. Named by Prof. Scribner.

Calamagrostis canadensis, Beauv. By brooks and on slides.

C. Langsdorfii, Trin. Slide at head of North Basin.

Deschampsia flexuosa, Trin. Common.

D. caespitosa, Beauv. Abundant in North Basin (*Briggs*).
Doubtful!

¹ According to Mr. Alfred Rehder this name applies to the Arctic and high-alpine plant, while the common low juniper of New England is *J. communis*, var. *canadensis*, Loud.

* *D. atropurpurea*, Scheele. West wall, North Basin, alt. 1230 to 1385 m. (4000 to 4500 ft.); between the East Monument peak and Pomola.

Trisetum subspicatum, Beauv. Slide at head of North Basin.

Avena striata, Michx. Slide at head of North Basin, alt. 1230 m. (4000 ft.); also in woods, Great Basin.

Danthonia spicata, Beauv. Shelves at 1230 to 1385 m. (4000 to 4500 ft.), North wall, North Basin.

Poa laxa, Haenke. Very common and variable.

P. pratensis, L. A few plants introduced at site of old Appalachian hut, near Chimney Pond.

P. nemoralis, L. Chimney Pond.

Glyceria nervata, Trin. Chimney Pond.

* *Festuca rubra*, L. (viviparous form). Slide at head of North Basin. Named by Prof. Scribner.

* *Agropyron violaceum*, Lange. North Mt. (*Briggs*); Slide at head of North Basin. The Maine plant formerly reported under this name is *A. Novae-Angliae*, Scribner.

Scirpus caespitosus, L. Common.

Eriophorum alpinum, L. North Mt. (*Briggs*).

Carex Grahmi, Boott. (See RHODORA, iii. 44, 49.) Depot Pond.

** *C. saxatilis*, L. (See RHODORA, iii, 44, 50.) Chimney Pond and Depot Pond. This is doubtless the *C. pulla*? reported by Scribner from Chimney Pond.

C. scabrata, Schw. Chimney Pond.

C. atrata, L., var. *ovata*, Boott. North Mt. (*Briggs*); West and Southwest walls, North Basin, alt. 1230 to 1385 m. (4000 to 4500 ft.).

C. lenticularis, Michx. Chimney Pond — first noted by Scribner.

C. rigida, Good., var. (?) *Bigelovii*, Tuck. Everywhere above timber-line.

C. torta, Boott. Meadow, head of Chimney Pond.

C. rariflora, Smith. Collected on Katahdin by Prof. G. L. Goodale in 1861, but not since detected.

C. arctata, Boott. Chimney Pond.

* *C. arctata*, Boott, var. *Faxoni*, Bailey. Occasional in the Great Basin, reaching an altitude of 1230 m. (4000 ft.) on the North wall of the North Basin.

C. debilis, Michx., var. *Rudgei*, Bailey. Lower portions of the mountain.

C. flava, L. Wet shelves at 1230 to 1385 m. (4000 to 4500 ft.). West wall, North Basin.

C. flava, L., var. *pumila*, Cosson & Germain (*C. viridula*, Michx.). Depot Pond.

**** *C. (Oligocarpae) katahdinensis*.** (Plate 32.) Caespitose: leaves flat, 1 to 2.5 dm. long, 3 or 4 mm. broad, more or less scabrous on the margins, with the similar bracts very much (2 to 6 times) overtopping the slender rough-angled culms: pistillate spikes mostly 3 or 4, all approximate, or the lower remote, short pedicelled, 8 to 14 mm. long, 5- to 10-flowered; scales ovate, scarious, whitish, with green midrib prolonged into a slender smooth or rough awn: perigynia elliptic, 3 or 4 mm. long, mostly exceeding the scales, obscurely resinous-punctate or glossy, 16- to 24-nerved, essentially beakless, with entire orifice: staminate spike short-peduncled or subsessile, 5 to 8 mm. long, generally hidden by the upper pistillate ones; flowers very few; the lower scale bract-like and rough-awned, nearly equalling the spike, the others acuminate. — Gravelly margin of Depot Pond, entrance to the Great Basin of Mt. Katahdin, July 16, 1900 (*E. F. Williams, J. R. Churchill and M. L. Fernald*).

A species intermediate in some of its characters between *C. conoidea* and *C. oligocarpa*. Its perigynium in shape, color and nerving is essentially like that of *C. conoidea*. The staminate spike and the elongated bracts are more as in *C. oligocarpa*. In its short culms, very much exceeded by the leaves, and in its approximate spikes it is unlike either of those species. *C. oligocarpa* is unknown east of the Connecticut valley; and although *C. conoidea* — chiefly a coastal species in Maine — follows the Penobscot to Eddington and occurs in the St. John valley, it is a plant of low altitudes and may be quickly distinguished from *C. katahdinensis* by its tall culm, scattered spikes, short bracts, and the longer elevated staminate spike with mostly oblong blunt scales.

C. laxiflora, Lam., var. *varians*, Bailey. Woods in the Great Basin.

C. pedunculata, Muhl. Katahdin (*Blake*).

C. scirpoidea, Michx. Common.

C. deflexa, Hornem. Common both in woods at the base and among rocks on the summit ridge.

C. Novae-Angliae, Schw. Common in the Great Basin.

C. communis, Bailey. Shelves at 1230 to 1385 m. (4000 to 4500 ft.). North wall, North Basin.

C. communis, Bailey, var. *Wheeleri*, Bailey. Abundant in woods above Depot Pond.

C. leptalea, Wahl. (*C. polytrichoides*, Muhl.) Mossy dripping shelves at 1230 to 1385 m. (4000 to 4500 ft.). West wall, North Basin.

C. brunnescens, Poir. (*C. canescens*, L., var. *alpicola*, Wahl.) Very common.

C. trisperma, Dewey. Outlet of Depot Pond.

Juncus filiformis, L. Katahdin (*Goodale*, *Scribner*); North Mt. (*Briggs*).

J. trifidus, L. Common.

Luzula spadiacea, DC., var. *melanocarpa*, Meyer. Common.

L. arcuata, Meyer. Katahdin (*Goodale*); common from the head of the Tableland to Pomola.

L. spicata, Desv. Common.

Smilacina racemosa, Desf. On shelves at 1230 to 1385 m. (4000 to 4500 ft.), North wall, North Basin.

Maianthemum canadense, Desf. Common, ascending to the heads of brooks.

Streptopus amplexifolius, DC. Woods, Great Basin.

S. roseus, Michx. Common, ascending to the heads of brooks.

Trillium undulatum, Willd. (*T. erythrocarpum*, Michx.). Common at low levels; ascending to 1230 m. (4000 ft.) in North Basin.

Iris versicolor, L. Depot Pond.

Habenaria dilatata, Hook. North Mt. (*Briggs*); wet shelves at 1230 to 1385 m. (4000 to 4500 ft.), West wall, North Basin.

Listera convallarioides, Torr. Katahdin (*J. W. Chickering* in *Gray Herb.*).

L. cordata, R. Br. Scattered but frequent.

Goodyera tessellata, Lodd. Woods, Great Basin.

Populus tremuloides, Michx. Dwarf trees a few feet high, near Chimney Pond.

Salix rostrata, Richardson. By small pool, below Chimney Pond.

S. argyrocarpa, Anders. Common, Eastern Spur (*Scribner*).

* *S. phyllicifolia*, L. Meadow at entrance to Great Basin; small pool, below Chimney Pond; head of Saddle Brook. A pubescent

willow, possibly referable here, was collected in the North Basin, but further study is necessary before its identity can be satisfactorily made out.

S. balsamifera, Barratt. By small pool, below Chimney Pond.

S. Uva-ursi, Pursh. Very common on more exposed slopes and tablelands.

S. herbacea, L. Katahdin (*Goodale*); in moss, head of Eastern Slide and on the "Saddleback," Eastern Spur (*Scribner*); in moss, head of Saddle Brook.

Corylus rostrata, Ait. Depot Pond.

** *Betula papyrifera*, Marsh., var. *cordifolia*, Regel. The common form of the Canoe Birch in the Great Basin, extending as a dwarf shrub to the crests and to the North summits. One of Regel's type specimens was collected on Katahdin in 1847 by Aaron Young.

B. odorata, Bechst., var. *tortuosa*, Regel. (*B. papyracea*, var. *minor*, Tuck., as to his own specimens in Herb. Gray). Summit of North Mt. This shrub, which also occurs on Washington, quite lacks the pubescence of *B. papyrifera*. It is identical with the dwarf form of the Scandinavian and Siberian *B. odorata*, and is well represented in Fl. Dan. xvii. t. 2818.

B. glandulosa, Michx. At various stations above timber-line. Most of the Katahdin material is var. *rotundifolia*, Regel.

Alnus viridis, DC. Common on lower slopes, following brooks to the crest.

Comandra livida, Richards. Abundant on the floor and the South wall of the North Basin; rare on North wall, South Basin.

Rumex Acetosella, L. Few plants introduced at site of old Appalachian hut, near Chimney Pond.

Polygonum viviparum, L. "Long Crooked Slide," South wall, South Basin (*Scribner*); notch between the Chimney and Pomola.

Arenaria groenlandica, Spreng. Common.

Stellaria borealis, Bigelow. By rivulet at 1385 m. (4500 ft.), South Basin (*E. D. Merrill*).

Thalictrum polygamum, Muhl. Depot Pond. Flowering specimens 2.5 dm. (10 in.) high.

Ranunculus Flammula, L., var. *reptans*, E. Meyer. Depot Pond.

R. acris, L. Few plants introduced at site of old Appalachian hut, near Chimney Pond.

Coptis trifolia, Salisb. Common.

Actaea spicata, L., var. *rubra*, Ait. Frequent in Great Basin, ascending nearly to the head of Saddle Brook.

Cardamine bellidifolia, L. "Long Crooked Slide," South Basin (Scribner); beach at head of Chimney Pond; shaded rocks from the Monument peaks to Pomola; West wall, North Basin.

Drosera rotundifolia, L. Wet shelves, at 1230 to 1385 m. (4000 to 4500 ft.); North and West walls, North Basin.

Saxifraga stellaris, L., var. *comosa*, Willd. Near the chimney — first detected in 1856 by Joseph Blake; north of the West Monument peak — first detected by Scribner.

Ribes lacustre, Poir. Common, ascending to the heads of streams.

R. prostratum, L'Hér. Common, with the last.

R. rubrum, L., var. *subglandulosum*, Maxim. Great Basin (*Goodale*); near head of Saddle Brook.

Prunus pennsylvanica, L. f. Shelves at 1230 to 1385 m. (4000 to 4500 ft.); North and West walls, North Basin.

P. Virginiana, L. With the latter.

Spiraea salicifolia, L. var. *latifolia*, Ait. With the last two.

Rubus idaeus, L., var. *strigosus*, Maxim. Common in woods, Great Basin.

R. canadensis, L. (*R. Millspaughii*, Britton). Depot Pond.

Fragaria virginiana, Mill. Shelves at 1230 to 1385 m. (4000 to 4500 ft.); West wall, North Basin.

Potentilla fruticosa, L. North Mt. (*Briggs*); on shelves with the latter species.

P. tridentata, Ait. Common.

Pyrus americana, DC. Frequent below the crest. Some of the young material may be *P. sitchensis*, Piper, Mazama ii. 107 (*P. sambucifolia* of Eastern authors, not Cham. & Schl.).

Amelanchier oligocarpa, Roem. Common, ascending nearly to the crest.

Empetrum nigrum, L. Common; fruit nearly ripe, July 13, on floor of North Basin.

Nemopanthus fascicularis, Raf. Common, ascending nearly to the crest.

Acer spicatum, Lam. Common, ascending nearly to the crest.

A. rubrum, L. Infrequent, Great Basin.

Oxalis Acetosella, L. Common.

Viola Selkirkii, Pursh. Woods in Great Basin; shelves at 1230 to 1385 m. (4000 to 4500 ft.), North wall, North Basin.

V. palustris, L. Common by streams on the upper slopes; Chimney Pond. Flowers white.

V. blanda, Willd. Common in Great Basin.

* *V. canina*, L., var.? Chimney Pond; shelves at 1230 to 1385 m. (4000 to 4500 ft.), North and West walls, North Basin. This plant, identical with that of alpine regions of the White Mts., occurs also in Labrador and Greenland. It differs from *V. canina*, var. *Muhlenbergii*, Gray (*V. labradorica*, Schrank) in its deep blue, not lavender, corolla, entire or subentire stipules, and more rounded upper leaves. Further study of the northern forms is necessary before its status and name can be exactly determined.

Epilobium angustifolium, L. Chimney Pond.

E. Hornemanni, Reich. Scattered, but generally distributed.

** *E. anagallidifolium*, Lam. Immature plants, probably of this high-northern species, were collected in moss near the heads of Saddle Brook and of Saddle Slide.

Heracleum lanatum, Michx. North Mt. (Briggs); Shelves at 1230 to 1385 m. (4000 to 4500 ft.), West wall, North Basin; Chimney Pond.

Cornus canadensis, L. Common.

C. stolonifera, Michx. Chimney Pond; floor of North Basin.

Pyrola minor, L. Katahdin (*Blake*); by brooks, Great Basin, ascending nearly to head of Saddle Brook.

Pyrola secunda, L. Under spruces, South wall, North Basin.

Moneses grandiflora, Salisb. Frequent in woods.

Chimaphila umbellata, Nutt. Katahdin (*Goodale*).

Monotropa Hypopitys, L. Katahdin (*Goodale*).

Ledum groenlandicum, Oeder. Common.

Rhododendron Rhodora, Don. Near the Pond, North Basin.

R. lapponicum, Wahl. Very common in more exposed places.

Loiseleuria procumbens, Desv. Katahdin (*Blake*); north of Monument peaks (*Scribner*); head of Saddle Brook; floor of North Basin.

Kalmia augustifolia, L. Frequent.

K. glauca, Ait. Common.

Bryanthus taxifolius, Gray. Above timber-line, East slope of Saddle; from head of Tableland to Pomola; upper slopes of North Mt.

Cassiope hypnoides, Don. Eastern edges of North Tableland (*Scribner*); North Mt. (*Briggs*); East slope of Saddle, above timberline; from the Monument peaks to Pomola.

Andromeda polifolia, L. Wet mossy shelf, at about 1290 m. (4200 ft.), West wall, North Basin. Shrubs 0.5 to 1 dm. (2 to 4 in.) high.

Cassandra calyculata, Don. Depot Pond.

Arctostaphylos alpina, Spreng. Common and fruiting abundantly on the more exposed slopes and tablelands.

Vaccinium pennsylvanicum, Lam., var. *angustifolium*, Gray. North Tablelands (*Scribner*); floor of North Basin.

V. canadense, Kalm. Common on lower slopes; ascending to 1385 m. (4500 ft.) in the North Basin.

V. uliginosum, L. Very common. Fruit beginning to ripen, July 13, on the floor of the North Basin.

V. caespitosum, Michx. Generally distributed on the upper slopes, but less common than the last.

V. Vitis-Idaea, L. Common, even at the summits.

V. Oxycoccus, L. Boggy outlet of Chimney Pond.

Chiogenes serpyllifolia, Salisb. Common on lower slopes.

Diapensia lapponica, L. Abundant on more exposed slopes and tablelands.

Trientalis americana, Pursh. Common in Great Basin; following far up the streams.

Apocynum androsaemifolium, L. Depot Pond.

* *Veronica alpina*, L. By brook, head of Chimney Pond.

Castilleja pallida, Kunth, var. *septentrionalis*, Gray. North Mt. (*Briggs*); shelves at 1230 to 1385 m. (4000 to 4500 ft.), walls of North Basin.

* *Euphrasia Oakesii*, Wettst. With the latter.

Melampyrum lineare, Lam. Floor of North Basin.

* *Galium kamtschaticum*, Steller. Brook-beds, North and West walls, North Basin.

G. triflorum, Michx. Chimney Pond.

Sambucus racemosa, L. Common by streams.

Viburnum pauciflorum, Pylaie. Abundant by streams; ascending nearly to the crest.

V. cassinoides, L. Common on lower slopes; ascending in North Basin to 1385 m. (4500 ft.).

Linnæa borealis, L. Walls of North Basin.

Lonicera caerulea, L. Shelves at 1230 to 1385 m. (4000 to 4500 ft.), West wall, North Basin.

Diervilla trifida, Moench. With the last; also on the North wall, North Basin.

Campanula rotundifolia, L. Common.

Solidago macrophylla, Pursh. Common.

S. Virgaurea, L., var. *alpina*, Bigelow. Common. There were very diverse forms immature in July. These need careful collecting.

Aster Radula, Ait. North Mt. (*Briggs*); common on the walls of the North Basin to 1385 m. (4500 ft.); Chimney Pond.

A. umbellatus, Mill. North and West walls, North Basin, at 1230 to 1385 m. (4000 to 4500 ft.).

A. acuminatus, Michx. With the last.

Gnaphalium supinum, Villars. Rocks in the Great Basin (*Scribner*); North Mt. (*Briggs*); gravelly bank, head of Saddle Brook.

Arnica Chamissonis, Less. Katahdin, rare (*Goodale*); foot of Eastern Slide (*Scribner*); North Mt. (*Briggs*); shelves at 1230 to 1385 m. (4000 to 4500 ft.), North and West walls, North Basin.

Senecio Balsamitae, Muhl. Depot Pond — first noted by E. D. Merrill.

Prenanthes trifoliolata, Fernald, var. *nana*, n. comb. (*P. alba*, var. *nana*, Bigelow. *P. serpentaria*, var. *nana*, Gray. *Nabalus nanus*, DC.) Common.

P. Boottii, Gray. Higher slopes; mostly on the crest.

EXPLANATION OF PLATE 32. — *Carex katahdinensis*: Fig. 1, portion of plant; fig. 2, scale from staminate spike; fig. 3, scale from pistillate spike; fig. 4, perigynium and scale. *C. conoidea*: Fig. 5, mature inflorescence; fig. 6, scale from staminate spike; fig. 7, perigynium and scale. *C. oligocarpa*: Fig. 8, mature inflorescence; fig. 9, scale from staminate spike; fig. 10, perigynium and scale.

BRYOPHYTES OF MOUNT KATAHDIN.

G. G. KENNEDY and J. F. COLLINS.

THE following preliminary list of the Musci and Hepaticae of Mount Katahdin is based on collections made from July 7-16, 1900. The Hepaticae were determined by Dr. A. W. Evans; the Dicrana by Dr. R. H. True, and the remainder by Dr. G. G. Kennedy, Messrs. J. F. Collins and E. B. Chamberlain.

Not all of the specimens collected have as yet been critically examined, but it is thought best to publish the list with the other papers on the mountain in the present number of RHODORA, and leave for further study the undetermined specimens. The introductory sketch by Dr. Kennedy and the list of species are followed by Mr. Collins' notes on some of the rarer mosses.

INTRODUCTORY SKETCH.

Our path up Mt. Katahdin, after leaving McLeod's camp, soon entered virgin forest where the shade of trees and green carpet of mosses refreshed the eyes weary with gazing on the burnt and fallen timber and rocky wastes of the Wassataquoik valley.

The rain came down with less pelting violence, and as I entered an area of large white cedars (*Arbor-vitae*) I found myself thinking of Richard Spruce and his wanderings in the Amazon valley with its tropical rains. Surely he could not have seen a more abundant moss garden than surrounded us, and we instinctively stopped to gather, or at least inspect, the mosses into which our feet had plunged. But our search was not rewarded by a multiplicity of species. It was all *Hypnum Schreberi*, Willd., *H. Crista-castrensis*, L. and *Hylocomium splendens* (Hedw.) Bry. Eur., with an occasional *Dicranum* on a projecting rock; and during the remainder of our walk to camp we saw practically nothing else. Perhaps the rain veiled our eyes, perhaps our footsteps needed constant attention, but those few mosses and none others were always in evidence. The *Hylocomium splendens* grows only in the woods, but the *Hypnum Schreberi* and *H. Crista-castrensis* are found to the very summit of the mountain, often in masses and often sparingly mixed with *Pogonatum*s and other mosses.

If these *Hypna* were abundant we were equally surprised at the scarcity of tree mosses; in the evening on comparing notes we found that neither of us had observed a moss on a tree, and in our whole stay at camp we found none. At what altitude the *Neckera*, *Leucodon* and *Orthotrichums* vanish we cannot say, but our list shows none collected on the slopes of Katahdin. In the woods for a few miles after leaving the East Branch grow *Neckera pennata*, Hedw., *Leucodon sciuroides*, Schaeg. and various *Orthotrichums* in as much luxuriance as in other northern forests, but we saw none on the mountain. It is probable that though infrequent they are not wholly wanting, for I found on one of the logs of our cabin a little

bunch of moss consisting of *Ulota crispa*, (L.) Brid., *Ulota crispula*, Bruch. and *Ulota Ludwigii*, (Brid.) Brid, and if these common forest species are there, the others may be confidently expected.

The Alpine region of Katahdin was very inadequately explored by us: its large area of tableland, and its many precipitous slopes and ledges would take more than one summer to investigate, and we may look for interesting discoveries in the future. The Tableland is an Alpine garden much larger than at Mt. Washington and of the same granitic rock formation; the dome of Mt. Washington is probably drier and the rainfall there has a less evident influence on vegetation from sinking deeper in among the rocky boulders and running off sooner from the want of soil to retain it. Mt. Washington has passed the era of slides and falls of masses of rock, while Katahdin is yet subject to both these changes, and is therefore in a transition state as regards the permanence of its present flora or the advent of new species. In fact, to compare small things with great, the change in the moss flora at Blue Hill in the Metropolitan Park Reservation near Boston, as shown in the steep sides of certain new avenues laid out a few years ago and now covered with *Pogonatum tenue*, Michx., *Leptotrichum pallidum*, Hampe and *Dicranella heteromalla*, Schimp. shows that earth slides soon make a resting place for the spores of mosses, where a very wet or a very dry season may make great changes in the abundance of the plants.

As compared with Mt. Mansfield, Katahdin lacks that slightly calcareous soil which gives a special character to the Green Mountain vegetation, and is shown in mosses by the presence of *Gymnostomums*, *Barbulas*, and *Physcomitriums* which with *Blindia*, *Seligeria*, and *Distichium* always seem to me to be planted in just a little limy dust. It is doubtful if these species will ever be found on Katahdin. It is probable that the summits of Mansfield, 4396 feet high, and Katahdin, 5215 feet high, have a larger rainfall than Washington, 6300 feet high; at least the experience of our party of botanists who have explored all three of the mountains would lead us to that conclusion.

LIST OF BRYOPHYTES COLLECTED IN THE BASINS AND ON THE UPPER SLOPES OF KATAHDIN.

A single asterisk (*) indicates species or varieties hitherto unrecorded from Maine, and double asterisks (**) indicate those hitherto unrecorded from New England.

MUSCI.

- * *Amblystegium varium* (Hedw.)
Lindeb.
Andreaea petrophila Ehrh.
Aulacomnium palustre (L.) Schwgr.
(a var. or form)
* *Bryum pallescens* Schleich.
Bryum pseudo-triquetrum (Hedw.)
Schwaegr.
Catharinaea angustata Brid.
* * " *sp*
Ceratodon purpureus (L.) Brid.
* *Conostomum boreale* Swz.
* * *Cynodontium polycarpum stru-*
miferum (W. et M.) Schpr.
Dicranella heteromalla (L.) Schpr.
* *Dicranoweisia crispula* (Hedw.)
Lindb.
Dicranum Bonjeani De Not.
" *congestum* Brid.
* * " *congestum flexicaule* Br.
Eur.
Dicranum elongatum Schwaegr.
* " *fulvellum* (Dicks.) Sm.
" *fuscescens* Turn.
* " *fuscescens Eatoni* R. et C.
Dicranum longifolium Ehrh.
" *undulatum* Ehrh.
Fissidens osmundoides (Swz.) Hedw.
* *Grimmia Doniana* Sm.
Hylocomium splendens (Hedw.) Br.
Eur.
Hylocomium umbratum (Ehrh.) Br.
Eur.
Hypnum Crista-castrensis L.
" *imponens* Hedw.
* " *montanum* Wils. mss.
" *Schreberi* Willd.
" *uncinatum* Hedw.
Leucobryum glaucum (L.) Schpr.
- * *Mielichhoferia nitida elongata*
(Hsch.) Br. Eur.
Mnium affine Bland. (a variety).
" *punctatum* (L.) Hedw.
" *spinulosum* Br. Eur.
Pogonatum alpinum (L.) Roehl.
Pogonatum capillare (Rich.) Brid.
* *Pogonatum urnigerum* (L.) Beau.
Polytrichum commune L.
" *juniperinum* Willd.
" *Ohioense* R. et C.
" *piliferum* Schreb.
" *strictum* Banks.
Pylaisia polyantha (Schreb.) Br.
Eur.
Racomitrium aciculare (L.) Brid.
Racomitrium fasciculare (Schräd.)
Brid.
Racomitrium lanuginosum (Hedw.)
Brid.
Racomitrium sudeticum (Funck) Br.
Eur.
Sphagnum acutifolium Ehrh.
" *papillosum* Lindb.
" *rigidum* (Nees) Schpr.
" *squarrosum* Pers.
* *Tayloria tenuis* (Dicks.) Schpr.
Tetraphis pellucida (L.) Hedw.
* *Tetraplodon angustatus* (L. fil.)
Br. Eur.
* * *Tetradontium Brownianum rig-*
idum (Funck) Jur.
Ulota crispata (L.) Brid.
" *crispula* Bruch.
" *Ludwigii* (Brid.) Brid.
* * *Webera elongata macrocarpa*
(Hsch.) Schpr.
Webera nutans Hedw.

HEPATICAÆ.

- | | |
|---|--|
| <i>Bazzania trilobata</i> (L.) S. F. Gray. | <i>Lophozia barbata</i> (Schreb.) Dum. |
| <i>Blepharostoma setiforme</i> (Ehrh.)
Lindb. | " <i>incisa</i> (Schrad.) Dum. |
| <i>Blepharostoma trichophyllum</i> (L.)
Dum. | " <i>inflata</i> (Hud.) M. A. Howe. |
| <i>Diplophyllia taxifolia</i> (Wahl.) Trev. | * " <i>lycopodioides</i> (Wallr.) Schif. |
| * <i>Gymnomitrium concinnatum</i> (Lt.)
Corda. | " <i>ventricosa</i> (Dicks.) Dum. |
| * <i>Lophozia alpestris</i> (Schleich.)
Evans, N. Comb. (<i>Jungerman-
nia alpestris</i> Schleich.) | <i>Marsupella emarginata</i> (Ehrh.)
Dum. |
| " <i>attenuata</i> (Lindb.) Dum. | * <i>Nardia obovata</i> (Nees) Lindb. |
| | <i>Ptilidium ciliare</i> (L.) Nees. |
| | * <i>Scapania umbrosa</i> (Schrad.) Dum. |
| | " <i>undulata</i> (L.) Dum. |

NOTES ON THE BRYOPHYTES OF MAINE,—II.

KATAHDIN MOSSES.

J. FRANKLIN COLLINS.

Amblystegium varium (Hedw.) Lindb. Widely distributed in North America, ranging from Newfoundland and New Brunswick to British Columbia and southward, though it seems to have been definitely reported from only four of the New England States,—Vermont, Massachusetts, Rhode Island and Connecticut. It also occurs in Europe, Asia and South America.

Catharinea. A few specimens of a *Catharinea* without fruit. In some of their characteristics these plants agree with Macoun's specimens of *Atrichum leiophyllum* Kindb. distributed in his Canadian Musci, and it seems best to refer them, provisionally, to this species until an opportunity occurs for further and more critical study. They are, with but little doubt, allied to *A. leiophyllum*. No record has been found of any New England *Catharinea* with undifferentiated leaf margins.

Conostomum boreale Swz. has been reported from Newfoundland, Gaspé, White, Adirondack and Rocky Mts., British Columbia and northward. On Katahdin this moss occurs, so far as these collections are concerned, from 4,000 feet upward—mostly above the Tableland.

Cynodontium polycarpum strumiferum (W. et M.) Schpr., occurs from Newfoundland and Labrador to British Columbia and high northward, but seems to have been reported thus far from only one of the States (Minnesota). The leaves of the Katahdin material are not sheathing at base and are papillose toward the apex. The margins are narrowly revolute and unistratose except at apex, where they are bistratose but not revolute. The dry capsule is arcuate, distinctly furrowed and strumose.

Dicranoweisia crispula (Hedw.) Lindb. About the ponds in the North and South Basins. Reported from Greenland, Labrador, Gaspé, Rocky and Selkirk Mts., Oregon, Washington, Utah, California, Idaho, etc. In 1846 Mr. S. T. Olney reported this moss ("Weissia crispula Hedw.") as occurring on rocks in Providence, R. I., but no specimens are preserved in the Olney Herbarium at Brown University. In 1888 Mr. Bennett omitted the moss from his catalogue. His reason for doing so is not known to the writer.

Dicranum congestum flexicaule Br. Eur. Apparently not reported from any definite station, yet recorded as occurring with the type (i. e. *D. fuscescens* Turn.).

Dicranum fulvellum (Dicks.) Sm. This species occurs in Europe. In North America it has been reported from Greenland, Oregon, New York and the White Mts. All the Katahdin material was collected on the main peak above the Tableland.

Dicranum fuscescens Eatoni R. et C. The writer has seen no fruit on these specimens, the stems of which reach a height of nearly 15 cm. Dr. True writes that he has this variety from Montana and New Hampshire.

Grimmia Doniana Sm. There seems to be very little doubt that a species of *Grimmia* collected near the summit and again at the Chimney should be referred to this species, although critical comparison with authentic specimens from other localities has not been made. Previously recorded from White Mts., Alberta and Western North America.

Hynum montanum Wils. mss. Heretofore reported from Newfoundland, Ontario and White Mts. The leaves differ but slightly from those figured in Sullivant's Icones, tab. 113.

Mielichhoferia nitida elongata (Hsch.) Br. Eur. These luxuriant sterile specimens (collected by Dr. Kennedy) were growing in a very wet depression on the sheltered side of a boulder near the summit.

The stems, in some cases fully 18 cm. long, were somewhat reclining and the green tips ascending. Except for this difference of habit the general appearance of the mass of plants is well represented in Bry. Eur. tab. 329. The leaves, however, differ from the illustrations there given in being narrower, with a decidedly stronger costa and a slightly sharper apex. This variation may be caused by its exceedingly moist habitat. Dr. Kennedy has compared the Katahdin specimens with Husnot's Mus. Gall. No. 331, and with Austin's Musci Appal. Suppl. I, No. 509, where it is given as *M. compacta* (*Bryum compactum*, Bot. Gaz. 2 : 111). Habitat, alpine regions of the White Mts., common; also mountains of New York and New Jersey.

Pogonatum urnigerum (L.) Beauv. Widely distributed in Europe, Asia, Africa and North America. It has been reported from Newfoundland, Nova Scotia, New Brunswick, Quebec, New Hampshire, Vermont, Massachusetts, and numerous other localities throughout North America.

Tayloria tenuis (Dicks.) Schpr. On bones and hair of caribou at the edge of the Tableland (G. G. K.). Young and without fruit, yet the leaves are characteristic of the genus, and after a careful comparison with specimens from Quebec, Vermont and Alaska, it seems safer to place the Katahdin plant here, rather than as a form of *T. serrata* (Hedw.) Br. Eur., with smaller, less serrate leaves. It corresponds very closely with Macoun's Can. Mus. 141, in areolation, size and shape of leaf, but differs in having a more attenuate apex and less strongly serrate margin in the upper part. Leaf drawings of the Katahdin specimens made with a camera correspond very accurately in all details with the illustrations of var. *tenuis* in the Bry. Eur. (tab. 285), except that the serratures are only about half as prominent as there figured (fig. 6, a.). *T. tenuis* is reported from New Brunswick, Nova Scotia, Gaspé, Greenland, Montana and Vermont. At least a portion of the *Tayloria* from Mt. Mansfield (collected by Dr. Kennedy) appears to be *T. serrata*.

Tetraplodon angustatus (L. fil.) Br. Eur. On nearly extinct remains of some unidentified animal. Previously reported in New England from the White Mts. It occurs in Newfoundland, New Brunswick (close to the Maine border), the Adirondacks, Lake Superior, Manitoba, British Columbia and northward; also in Europe. The leaves of this material vary slightly from some of the

published descriptions of the species in having the costa often dissolving below the sulula and the teeth of the upper margins long, slender and prominent. Occasionally a single tooth reaches a length of .3 mm. or more. The lower leaves are about $2 \times \frac{3}{4}$ mm., the longer ones of the stem 4×1 mm., and the perichaetial $2 \times \frac{3}{4}$ mm. These measurements do not include the subula, which on the lower leaves is about $\frac{3}{4}$ mm. long, becoming gradually longer on the succeeding leaves until on the inner perichaetial it reaches a length of about 3 mm., and exceeds the lamina. Tab. LXII. B. fig. 1a. of Braithwaite's British Moss-flora would correctly represent the apex of these leaves if the costa dissolved about twice as far from the extreme apex as there figured. The only noticeable difference between the leaves of the Katahdin plants and authentic Scandinavian specimens is that the marginal teeth are usually somewhat longer in the former than in the latter. Unfortunately only a few imperfect capsules were obtained.

Tetradontium Brownianum rigidum (Funck) Jur. (*Tetraphis ovata* Funck). Apparently not hitherto reported from North America. This appears to be identical with H. C. Funck's specimens distributed in his "Cryptogamische Gewächse des Fichtelgebirges" with which the Katahdin specimens have been compared at the Harvard Cryptogamic Herbarium. Limpricht (Die Laubmoose) regards this genus as composed of one species (*Brownianum*) and two varieties (*repandum* and *rigidum*). The species in its typical form, with the long frondiform basal leaves, has apparently not been reported from this country. The var. *repandum* (*T. repandum* Schwaegr.) has been recorded from the White Mt. region and Newfoundland, yet the writer has been unable to detect, with a strong hand lens, any of the characteristic flagelliform basal shoots on the New Hampshire specimens in the James Herbarium. It is quite possible that at least a portion of the White Mt. material may lack these shoots which form practically the only definite means of separating var. *repandum* from var. *rigidum*. Dr. Grout's *Tetradontium*, from Mt. Prospect, N. H., is apparently identical with the Katahdin plant; both have the very short frondiform leaves, and both are without basal flagellae. Intergrading forms are reported from Europe which connect the species with its var. *rigidum*, and it would perhaps be better (following many authors) to treat the latter as a *form* rather than as a *variety*.

CARDAMINE BELLIDIFOLIA IN CUMBERLAND COUNTY, MAINE. — On Sept. 10, 1900, I found this rare alpine species by a stream in West Baldwin, only a few miles northwest of Portland. The plant was growing in crevices of granite rock by a stream in a deep gorge. This stream descends from the highest hills of the region, Saddleback Hills, which are wooded to the top and have an altitude of only 1190 feet. The point at which the *Cardamine* was found was near the base of these hills, perhaps at an altitude of 500 feet. Lest there should be some mistake about the identity of the plant, it was sent to the Gray Herbarium, and there pronounced *C. bellidifolia*. It is surprising to find this plant, otherwise known south of Labrador only in the alpine regions of Katahdin and Washington, in a low section like West Baldwin, for there the country is ordinarily very dry and the soil light and sandy, while the region is much more characterized by southern species — *Galium circaezans*, *Gerardia quercifolia*, *Adiantum pedatum*, *Desmodium paniculatum*, *Helianthus divaricatus*, and *Lespedeza frutescens* — than by northern plants. — KATE FURBISH, Brunswick, Maine.

ADDITIONS TO THE FLORA OF WORCESTER COUNTY, MASSACHUSETTS, — III.

ROLAND M. HARPER.

As I only spent two or three weeks in Massachusetts in 1900, I was not able to find many more additions to the flora of Worcester County. But a few plants, which I collected in 1899, have since been identified as species not previously known from the county, and these with a few which I collected last May and June make up the following list.

Panicum macrocarpon, Le Conte. Collected in rich, shady woods, Southbridge, June 24, 1899.

Eleocharis palustris, var. *glaucescens*, Gray. Moist meadow, Southbridge, June 24, 1899.

Scirpus rubrotinctus, Fernald. One specimen collected beside a small brook, Hardwick, July 2, 1899. Identified by Mr. Fernald. It may of interest to note here that I collected this species the following day in Fitzwilliam, N. H., at one of the localities cited in the original description (RHODORA, 2: 20, 21. 1900).

Antennaria Canadensis, var. *Randii*, Fernald. Dry roadside, Southbridge, May 25, 1900. Pistillate only. This variety seems to be more common in southern Worcester County than the type. Previously reported only from Maine and Vermont; but Mr. Fernald tells me that he now refers to this variety some specimens collected in Lexington, Mass.

Antennaria fallax, Greene. Dry roadsides, not common. Southbridge, May 29, 1900; Charlton, May 30.

Antennaria neodioica, var. *attenuata*, Fernald. Dry roadsides, often with the type, Southbridge, May 29, 1900. Not previously reported from Massachusetts.

Antennaria petaloidea, Fernald. Dry roadsides, Southbridge, May 30, 1900. Only a few specimens found, all pistillate. This species has been known hitherto only from Maine, New Hampshire and Vermont.

Two plants of my 1899 list (RHODORA, 1: 202), on which I made further observations last year, might be mentioned here.

On June 4 I collected *Carex torta* again at the place where I found it in 1899 (in Southbridge), and traced it from the artificial canal to the banks of the Quinebaug River near the upper end of the canal, where it was much more abundant, thus confirming my former supposition in regard to the origin of my first specimen.

On June 12, the day I left Massachusetts, I made a short visit to my locality for *Orontium aquaticum*, in Dudley, and although only one specimen was observed, I was surprised to find that it bore no less than eleven spadices in various stages of flower and fruit. So this species seems to be in no immediate danger of disappearing from this locality.

Two other plants, which had previously been reported each from a single town in the county, were collected last year at new stations.

Woodsia Ilvensis, R. Br. (reported only from Spencer), I found in Charlton, May 30; and *Selaginella rupestris*, Spring (reported from Worcester), I found in Sturbridge, June 6.

COLUMBIA UNIVERSITY.

A LIST OF PLANTS SEEN ON THE ISLAND OF MONHEGAN, MAINE, JUNE 20-25, 1900.

MABEL PRISCILLA COOK.

THE following list of plants on the island of Monhegan, Maine, compiled from the results of the botanizing done during so short a visit to the island, and necessarily limited to the plants of that particular season, is in no way to be considered a Flora of Monhegan. There are very few plants included in the list which were not found in bloom. I feel, however, that the territory was very well gone over as I had the advantage of the guidance of an old and enthusiastic visitor to Monhegan. The sixteen miles of ocean between the island and the "main" led me to hope that I might find some especially interesting features, in the local flora, so that it was a surprise to find what a large number of introduced species were present. The absence of salt marshes and of any true beaches eliminates a large number of those plants that we expect to find in any list from a sea-shore station. A very potent agent in the distribution of plants over the whole area of the island has been the presence of large flocks of sheep, in whose fleeces the seeds of many distinctly introduced species have been carried to the most remote parts of the island.

It will be interesting to see what effects the severe fire that devastated the eastern end of the island during the late summer and fall of 1900 will have upon the flora. A peat-bog in the center of the island burned, underground, for weeks, and a large tract of woods was destroyed.

In the following list asterisks have been employed to distinguish introduced species, and the sign † indicates plants common upon the island. The nomenclature followed is, as far as possible, that of the Synoptical Flora. I am indebted to Mr. M. L. Fernald for the determination of the Carices.

† *Thalictrum polygamum*,
Muhl.

† * *Ranunculus repens*, L.

* *R. bulbosus*, L.

† * *R. acris*, L.

† *Oxalis trifolia*, Salisb.

* *Aquilegia vulgaris*, L.

† * *Sisymbrium officinale*, Scop.

† * *Capsella Bursa-pastoris*,
Moench.

† *Helianthemum majus*, B. S. P.

† *Lechea intermedia*, Leggett.

- † *Viola palmata*, L., var. *cucullata*, Gray.
V. blanda, Willd.
† *V. lanceolata*, L.
† *Arenaria lateriflora*, L.
† * *Cerastium vulgatum*, L.
† *C. arvense*, L.
† *Sagina procumbens*, L.
† *Spergularia rubra*, Presl.
† * *Hypericum perforatum*, L.
† *H. Canadense*, L.
† *H. Virginicum*, L.
† * *Malva rotundifolia*, L.
Geranium Robertianum, L.
† *Oxalis cymosa*, Small.
† *Impatiens biflora*, Walt.
† *Ilex verticillata*, Gray, var. *tenuifolia*, Watson.
Acer spicatum, L.
† *A. rubrum*, L.
Rhus copallina, L.
† *R. Toxicodendron*, L.
† * *Trifolium pratense*, L.
† * *T. repens*, L.
† * *Vicia Cracca*, L.
Lathyrus maritimus, Big. (one station, on rocks).
Prunus serotina, Ehrh.
† *Spiraea salicifolia*, L.
† *Rubus triflorus*, Richardson.
† *R. idaeus*, L., var. *strigosus*, Maxim.
† *R. argutus*, Link.
† *R. villosus*, Ait. (*R. Canadensis* of authors).
† *Fragaria Virginiana*, Miller (everywhere, since the sheep have been taken off the island).
- † *Potentilla argentea*, L.
† *P. littoralis*, Rydb.
† *P. tridentata*, Ait.
† *P. Anserina*, L.
† *P. simplex*, Michx.
† *Rosa Carolina*, L.
† *R. lucida*, Ehrh.
† *Pyrus arbutifolia*, L., var. *melanocarpa*, Hook. f.
Amelanchier Canadensis, T. & G.
† *Ribes oxyacanthoides*, L.
† *R. prostratum*, L'Her.
† *Drosera rotundifolia*, L.
† *D. intermedia*, Hayne, var. *Americana*, DC.
Epilobium angustifolium, L. (plentiful in one station).
E. coloratum, Muhl. (seen in one station on rocks).
Oenothera pumila, L.
Coelopleurum actaeifolium, Coult. & Rose (*C. Gmelini* of authors, not Ledeb.).
* *Heracleum lanatum*, Mx. (one station seen).
† * *Carum Carui*, L.
† *Cicuta maculata*, L.
† *Hydrocotyle Americana*, L.
† *Aralia nudicaulis*, L.
A. hispida, Vent.
† *Cornus Canadensis*, L.
Sambucus Canadensis, L.
† *Linnaea borealis*, Gronovius.
Houstonia caerulea, L.
Galium trifidum, L.
Galium triflorum, Michx.
† *Eupatorium perfoliatum*, L.
Solidago sempervirens, L.
S. nemoralis, L.

† *Aster cordifolius*, L.
Erigeron strigosus, Muhl.
Antennaria Parlinii, Fernald.
A. neodioica, Greene.
† *Ambrosia artemisiaefolia*, L.
† * *Anthemis Cotula*, DC.
* *Achillea Millefolium*, L.
† * *Chrysanthemum Leucanthemum*, L.
† * *Arctium minus*, Bernh.
† * *Cnicus lanceolatus*, Hoffm.
† * *C. arvensis*, Hoffm.
* *Leontodon autumnalis*, L.
* *Hieracium aurantiacum*, L.
† *Prenanthes trifoliolata*, Fernald.
† *P. altissima*, L.
† * *Taraxacum officinale*, Weber.
† * *T. erythrospermum*, Andr.
(everywhere more common than *T. officinale*).
† *Vaccinium Pennsylvanicum*, Lam.
† *V. Oxycoccus*, L.
Rhododendron Rhodora, Don.
Moneses grandiflora, Salisb.
† *Lysimachia stricta*, Ait.
† * *Anagallis arvensis*, L.
Gentiana crinita, Froel. (not seen, but reported by reliable authority).
† *Menyanthes trifoliata*, L.
† *Convolvulus Sepium*, L.
† * *Verbascum Thapsus*, L.
† *Rhinanthus Crista-galli*, L.
† *Lycopus sinuatus*, Ell.
† *Prunella vulgaris*, L.
† *Plantago major*, L., var. *minima*, Decaisne. (very common; see note in Proc.

Portland Soc. Nat. Hist. II, 85, on the unusual downiness).

† *P. maritima*, L.
† * *Chenopodium album*, L.
† * *Rumex crispus*, L.
† * *R. Acetosella*, L.
† * *Polygonum aviculare*, L.
† * *P. Persicaria*, L.
† *P. sagittatum*, L.
† *Urtica gracilis*, Ait.
† *Myrica cerifera*, L.
Betula papyrifera, Marsh. (a few trees and a good many seedlings where spruces have been cut down).
† *Alnus viridis*, DC.
Populus tremuloides, Michx.
† *P. balsamifera*, L.
† *Picea alba*, Link.
† *P. rubra*, Link.
Abies balsamea, Miller (more young than old growth).
† *Juniperus communis*, L., var. *canadensis*, Loud.
† *J. Sabina*, L., var. *procumbens*, Pursh.
Liparis Loeselii, Richard.
Spiranthes cernua, Rich. (on good authority: not seen).
† *Pogonia ophioglossoides*, Nutt.
† *Iris versicolor*, L.
† *Sisyrinchium angustifolium*, Mill.
† *Maianthemum Canadense*, Desf.
Streptopus roseus, Michx.
Medeola Virginiana, L.
Typha latifolia, L.
Arisaema triphyllum, Torr.

Acorus Calamus, L.
Carex folliculata, L.
C. intumescens, Rudge.
C. rostrata, Stokes.
C. lurida, Wahl.
C. maritima, Müll.
C. crinita, Lam.
C. debilis, Michx., var. *Rudgei*,
 Bailey.
C. flava, L.
C. flava, L., var. *pumila*, Coss.
C. pallescens, L.
C. conoidea, Schk.
C. aurea, Nutt. (Very unusual
 away from slate along the
 rivers of the interior.)
C. leptalea, Wahl. (*C. polytri-*
choides, Muhl.)
C. stipata, Muhl.
C. sterilis, Willd., var. *excelsior*,
 Bailey.

LEXINGTON, MASS.

C. canescens, L., var. *vulgaris*,
 Bailey.
C. trisperma, Dewey.
C. foenea, Willd.
C. straminea, Willd., var. *aperta*,
 Boott.
† *Equisetum arvense*, L.
† *E. sylvaticum*, L.
Polypodium vulgare, L.
† *Pteris aquilina*, L.
† *Asplenium Filix-foemina*,
 Bernh.
† *Phegopteris polypodioides*, Fée.
P. hexagonoptera, Fée.
† *Aspidium Thelypteris*, Swartz.
† *A. spinulosum*, Swartz.
† *Onoclea sensibilis*, L.
† *Osmunda regalis*, L.
O. Claytoniana, L.
† *O. cinnamomea*, L.

[It is worth while to compare the foregoing list with the plants found upon Mt. Desert Island, some sixty miles to the northeast. Of the species which Miss Cook has found upon Monhegan the following have not been seen upon Mt. Desert or the neighboring islands, — *Helianthemum majus*, *Rhus copallina*, *Gentiana crinita*, *Phegopteris hexagonoptera*, and *Carex aurea*, although the latter is reported from Eagle Island in Penobscot Bay. *Menyanthes*, while abundant upon Great Cranberry Isle, is rather rare upon the main island of Mt. Desert; *Cerastium arvense* has been found only upon the Duck Islands some distance seaward; and though *Ranunculus bulbosus* occurs on Mt. Desert it is as yet very rare. On the Duck Islands, as on Monhegan, *Taraxacum erythrospermum* is more abundant than *T. officinale*. *Aster cordifolius*, formerly known only at Somesville, the oldest permanent settlement on Mt. Desert, has recently established itself at more than a dozen points upon the Island and is spreading rapidly. — E. L. R.]



C. E. Faxon del.

Fig. 1-4, *CAREX KATAHDINENSIS*. FIG. 5-7, *C. CONOIDEA*.

Fig. 8-10, *C. OLIGOCARPA*.

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If he has spent hours about home searching for something really new to him, he will start with delight as he sees the fields and banks of blue *Aster Lindleyanus* just above Oldtown, or the clearings crimson in September with the drooping tassels of *Polygonum Careyi*. Or, if he is fortunate enough to get off in May, he will be greeted from recent clearings by fragrant white masses of Sweet Coltsfoot, *Petasites*.

Just beyond Alton, he cannot help longing to explore the indefinite miles of Sphagnum swamp, and if he looks to the West, he will see a beautiful little round pond bordered by gnarled Black Spruces, which he instantly knows must be covered with the tiny Mistletoe, *Arceuthobium pusillum*. Alton bog is well worth exploring, but it is only a small area compared with the hundreds of miles of such country through North-central Maine, and unless one has plenty of time he should save that and his enthusiasm for "farthest north."

If one is bound for Moosehead Lake he will follow the Piscataquis River, where, along the banks, or in the neighboring woods and swamps, he will find at different seasons many good things, among them *Anemone riparia*, *Epilobium palustre*, *Erigeron hyssopifolius*, *Antennaria petaloidea*, *Senecio Balsamitae*, *Vaccinium caespitosum*, *Pyrola asarifolia*, *Primula mistassinica*, *Calypto*, *Allium Schoenoprasum*, *Carex deflexa* and *Lycopodium sabinæfolium*.

If he wants the rare **CALAMAGROSTIS NEMORALIS** he should visit the Chocorua-like peak of Boarstone Mt., on Lake Onawa (reached from Monson).

When he reaches Moosehead and Mt. Kineo he will naturally want to

BANGOR AND AROOSTOOK RAILROAD.

get **CAREX PORTERI**, *C. saxatilis*, var. *miliaris*, and *C. Grahamei* from the gravelly shores or low woods; and on Kineo he will look for *Draba incana*, var. *arabisans*, *Primula farinosa*, *Shepherdia canadensis*, *Carex capillaris*, and *Aspidium fragrans*.

In the Katahdin Iron Works region, too, the botanist will be very happy, but the great botanizing begins as he approaches southern Aroostook County. From the main line of the railroad beyond the Katahdin Iron Works district one has some splendid views of Mt. Katahdin itself with the neighboring masses of Sordnahunk and Traveller Mts. If one does not make up his mind at once to explore the giant amphitheatres and castellated ridges of Katahdin, he is no true lover of the best of botanical exploring and of inspiring mountain life. (For detailed account of Katahdin and its flora, as far as known, see RHODORA for June, 1901.)

At Crystal flag-station one should stop long enough to explore a bit of the great bog which furnishes the upper waters of Molunkus Stream. Following the railroad back half a mile he will find himself surrounded by masses of *Betula pumila*, *Lonicera oblongifolia*, and other northern shrubs, with an herbaceous flora including *Parnassia caroliniana*, **DRO-SERA LINEARIS**, *Valeriana sylvatica*, *Aster juncus*, *Pyrola rotundifolia*, var. *uliginosa*, *Toxildia glutinosa*, *Carex chordorhiza* and *C. livida*.

If he wishes to stop for some time in the region (and who does not) he can have good accommodations at Island Falls; and there, near the Mattawamkeag River, he will get the local **ANTENNARIA RUPICOLA**, *Hieracium vulgatum*, *Erigeron acris*, and *Halenia deflexa*. In the river, itself, and in Mattawamkeag Lake he will revel in September, dragging up such prizes as *Myriophyllum Farwellii*, *M. alterniflorum*, and *Potamogeton obtusifolius*.

When Houlton is reached one should make up his mind to stop at some of the numerous villages between there and the Aroostook River, for the Cedar (*Arbor-vitae*) swamps of the Meduxnakeag and the Presque Isle valleys are the homes of *Cypripedium spectabile*, *Microstylis monophylla*, *Carex vaginata*, and scores of other species of absorbing interest.

The valleys of the Aroostook and the main St. John—for instance at Fort Fairfield, Van Buren, Fort Kent, and St. Francis—furnish one of the most striking floras of New England. There among other species one will get **THALICTRUM CONFINE** and **T. OCCIDENTALE**, **OXY-TROPIS CAMPESTRIS**, var. **JOHANNENSIS**, *Hedysarum boreale*, **TANACETUM HURONENSE**, **PRENANTHES RACEMOSA** and **P. MAINENSIS**, *Gentiana Amarella*, var. *acuta*, **PEDICULARIS FURBISHIAE**, **SALIX GLAUCOPHYLLA** and **S. ADENOPHYLLA**, **GOODYERA MENZIESII**, *Juncus alpinus*, var. *insignis* and **J. TENUIS**, var. **WILLIAMSII**, *Triglochin palustre*, *Scirpus Clintonii*, **CAREX CRAWEI** and **C. BICOLOR**, *Equisetum palustre* and *E. variegatum*, and *Lycopodium sitchense*.

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